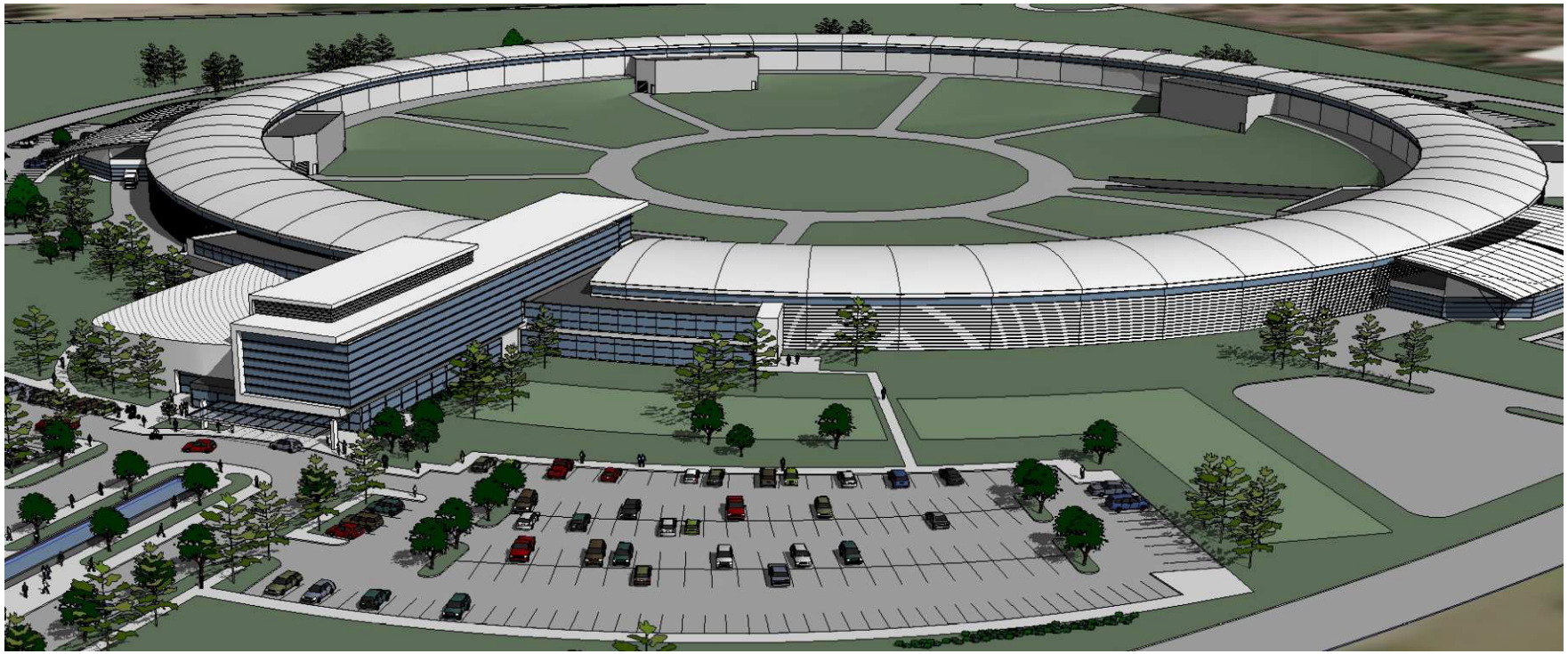
NSLS-II VUV Undulator Beamline



Steve Hulbert
NSLS-II User Workshop
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NSLS-II Soft X-ray Undulator Beamlines

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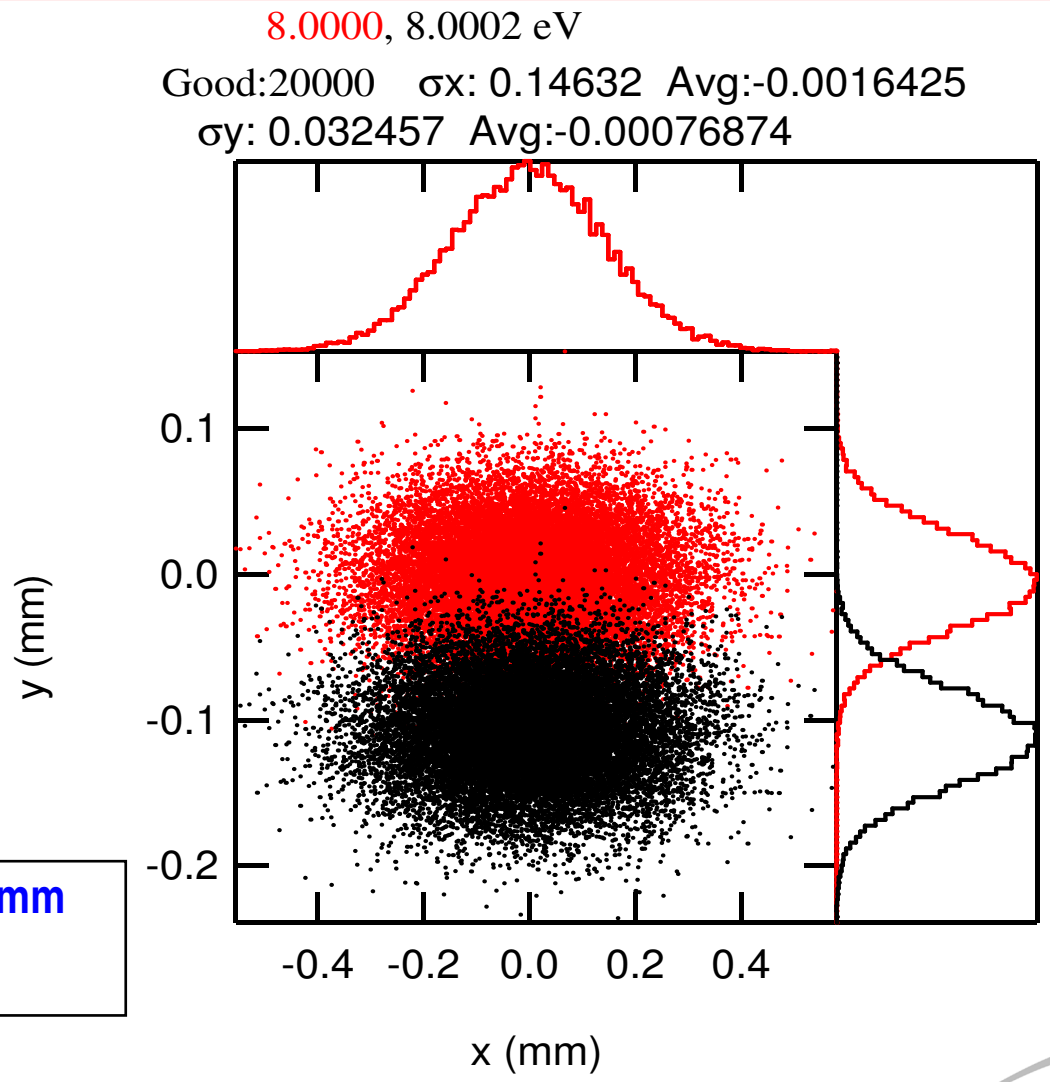
The extremely high brightness of NSLS-II in the soft x-ray range will enable the design and implementation of the next generation of soft x-ray beamlines. These beamlines will have

$$(\text{resolving power}) \times \text{flux} \times (\text{spot size})^{-1}$$

product considerably greater than is available presently (2007), as well as fast (kHz) polarization switching capability. These beamlines can be optimally matched to a broad array of soft x-ray measurement techniques.

VUV VLS PGM Resolution at 8eV

- At hν=8eV, the 8.0000eV and 8.0002eV ray patterns are quite well separated at the exit slit
- Resolution is better than 0.2meV at 8eV (>40,000 resolving power).



Grating line density: 600 lines/mm

PGM c-value = 2.2

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Power loading problem will be even more severe for EPU100-based VUV beamline

Name	EPU45	EPU100
Type	EPU	EPU
Photon energy range	Soft x-ray (180 eV - 7 keV)	VUV (8 eV - 4 keV)
Period (mm)	45	100
Length (m)	4.00	4.00
No. of Periods	89	40
Peak magnetic field strength B(T), linear mode	1.03	1.5
Max K_v, linear mode	4.33	14.01
Peak magnetic field strength B(T), circular mode	0.64	1.15
Max K_h=K_v, circular mode	2.69	10.74
Minimum hν fundamental, linear mode (eV)	183	8.6
Minimum hν fundamental, circular mode (eV)	411	14.6
Total power (kW)	12.09	25.64
On-axis power density (kW/mrad^2)	40.03	26.33